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LARYNGOSCOPY IN CASES OF TUMOR INVOLVING THE RECURRENT LARYNGEAL NERVE.

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THE phenomena excited by the pressure of tumors upon the intra-thoracic organs are familiar to every physician. These are referable to the respiratory system and voice, the function of deglutition, the venous circulation and the arterial pulse. In the present paper I shall refer only to the first two of the phenomena above mentioned, and of these shall dwell particularly upon the effect produced upon the functions of the vocal apparatus. Before, however, proceeding to the consideration of the subject of an addition to the means of diagnosing thoracic tumors, and as an interesting and fitting preliminary to that subject, I shall refer to a case of thoracic aneurism, in which I had the opportunity of seeing, by the aid of the laryngoscope, the changes produced in the larynx by pressure upon the pneumogastric and recurrent laryngeal nerves.

In November, 1864, there came under my care a man who exhibited a tumor bulging through the upper part of the sternum, the record of whose case I afterwards read before the Society, in connection with the minutes of the autopsy made by Dr. Ellis, to whose care, at the Massachusetts General Hospital, I had advised the patient to commit himself. For the details of this case I refer the members of the Society to the *Extracts from the Records of the Society*, published in *The Boston Medical and Surgical Journal*, Vol. lxxii., p. 18. At this time I shall refer only to the chief points in the record of the case itself and of the autopsy.

When I first saw Watson, the patient referred to, namely, on Nov. 3d, there was no doubt of the existence of a tumor which was pressing upon important nerves and vessels. There was also little doubt that this tumor was an aneurism, either of the aorta implicating the arteria innominata, or of this latter vessel itself. The appearances exhibited by the tumor; the pain shooting from the shoulder up the side of the neck; the inequality of the pulse at the wrists; the

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hoarseness and dyspnoea, paroxysmal in their character, all served to make the diagnosis easy. The patient died, of exhaustion, Dec. 5th, and at the autopsy an aneurism was found just at the point of origin of the arteria innominata, and seeming to belong to it rather than to the aorta. The tumor pressed forwards through the sternum, and backwards flattening the arteria innominata itself, and compressing the pneumogastric nerve, the right primary bronchus and the œsophagus. In the minutes of the autopsy no mention is made of the recurrent laryngeal nerve, and it was probably implicated in the tumor in such a manner as to escape observation after the parts were removed from the body.

On two occasions before the patient's entrance into the hospital, I made a laryngoscopic examination, and I copy from my note-book the description of the appearances presented, and offer also a wood-cut, copied from the drawing I made at the time.

Upon examination with the laryngoscope, on Nov. 23d, the right vocal cord was seen to be slack,\* making a curved line from the anterior insertion, which in this case was visible, to the arytenoid cartilage. This cartilage lay considerably nearer the median line than its fellow of the opposite side, and the processus vocalis stood out quite prominently into the aperture of the glottis. During respiration, no movement of the right vocal cord took place, while on the left side the cord swung to and fro with inspiration and expiration.† Upon an attempt at phonation, the left cord approached the median line; the right cord also moved, so that the arytenoid cartilages came together pretty well, the cartilages of Santorini also touching one another. The right vocal cord did not, however, become tense, and its vibrations, as might be expected, were very coarse. There seemed to be, moreover, a somewhat general injected condition of the mucous membrane lining the interior of the larynx, although this was not very marked.

In the cut subjoined, E is the epiglottis; s. the cartilage of Santorini surmounting the arytenoid cartilage; w, the tubercle of Wrisberg; p v, the processus vocalis; r c, the right vocal cord; l c, the left vocal cord. Through the glottic aperture are seen rings of the trachea.



It will readily be seen that with such a condition of the parts an altered state of the voice was inevitable. A slight degree of hoarseness might have been occasioned by the abnormal condition of the mucous membrane, but the excessive hoarseness which existed in

\* It will be remembered that in the laryngoscopic mirror the parts are reversed, that which appears to be the right side being really the left.

† I have noticed that this movement, studied particularly by Prof. Dalton in his experiments on the lower animals, is not uniformly present except where, from some cause or other, the respiratory movements are hurried.

this case was evidently due, as could be seen in the mirror, to the slackened condition of the right vocal cord.

I shall here offer a few remarks and cite some cases, to show in what manner the laryngoscope may aid in the diagnosis of thoracic tumors. Cases of such tumors are not rare, in which the closest examination of the chest has for a long time, and even up to the time of death, failed to detect the actual cause of the symptoms presented, and although in many cases, perhaps in most, the fact that a tumor of some kind exists is easily made out, in others there is the greatest doubt whether the laryngeal symptoms are due to inflammatory action in the larynx itself, or to irritation of the recurrent nerve. The best, and, before the invention of the laryngoscope, almost the sole aid in cases where only laryngeal symptoms were present, was the rule indicated particularly by Dr. Stokes, viz., in the alteration dependent on laryngeal disease, the hoarseness or aphonia is constant; while in the functional affection of the voice from pressure on the recurrent nerve, remarkable variations in the tone and power of the voice frequently occur within short spaces of time. I may mention also the stress laid by Stokes on the loud, ringing cough. Instances, however, are on record in which tracheotomy has been performed for acute laryngitis, when the symptoms depended upon aneurism of the thoracic aorta. Dr. Watson mentions such an example.\*

Of cases bearing on this subject, Liston's is perhaps known to most of the members of the Society. Dr. O'Ferral, in vol. vii. of the *Medical and Chirurgical Review* of Edinburgh, in connection with the relation of an obscure case of aneurism, says that after an unusually careful examination of Mr. Liston's chest, not the slightest symptom could be found looking to the presence of aneurism.

I proceed to mention other cases pertinent to this subject.

In the *London Medical Times and Gazette*, Vol. xlix., I find one or two articles which I shall copy at some length, as affording excellent arguments in favor of the employment of the laryngoscope in doubtful cases of the kind under consideration.

The first article is on page 33, and is a report of hospital practice, the case brought up being under the care of Dr. Geo. Johnson, one of the best English laryngoscopists.

*"Aneurism of the Arch of the Aorta, compressing the Vagus and Recurrent Nerves, and causing Symptoms of Laryngitis. Diagnosis by aid of the Laryngoscope."*

This case is a good illustration of the occurrence of laryngeal symptoms in thoracic aneurism from pressure on the recurrent laryngeal. It shows, too, the great practical value of the laryngoscope in affording the negative evidence that there was no actual disease

\* It should be mentioned in this connection that a tumor may so obstruct the veins leading from the larynx as to cause a dropsical condition of the laryngeal mucous membrane, and this to such a degree as to demand the performance of tracheotomy.

in the larynx. In all cases of laryngeal dyspnœa, especially when the dyspnœa is paroxysmal, the chest should be carefully examined; and, indeed, when there are merely symptoms of laryngitis, or even altered pitch of voice, it should not be omitted. "It cannot," says Dr. Gairdner, "be too strongly insisted on, that a physical examination of the chest should take place in all cases of supposed laryngeal disease." But sometimes an examination of the chest does not give us definite information, as in Dr. Johnson's case. To quote again from Dr. Gairdner's paper:—"The absence of the physical signs of aneurism or tumor should not suffice to remove completely the suspicion that they may be concerned in the affection of the larynx." In such cases the laryngoscope supplies a real want.

J. H., aged 31, a hawker, of intemperate habits, was admitted, under the care of Dr. George Johnson, into King's College Hospital, July 16, 1863. About seven weeks before his admission, after being out drinking all night for five nights in succession, he first experienced a sensation of "stoppage in the throat," and lost his voice. The throat symptoms continued more or less until the time of his admission. For eight days prior to admission he had experienced a difficulty in swallowing solids. For five days the voice had become more husky; he had cough and difficulty of breathing, and the breathing was attended with a loud noise in the throat.

The symptoms on admission were cough, with dyspnœa and noisy laryngeal breathing, hoarseness, and difficulty in swallowing solids. He states that sometimes the noise in his throat entirely ceases, and he partly regains his voice, but the noise is usually louder while he is asleep.

On laryngoscopic examination by sunlight, the mucous membrane of the larynx was seen to be slightly congested, but there was no swelling; the arytenoid cartilages were freely movable, and the glottis opened wide during inspiration. At the time of the examination, the breathing was not stridulous.

It was evident (Dr. Johnson remarked) from this examination, that the laryngeal symptoms were not the result of laryngitis or other structural disease in the larynx. Aneurism of the aorta, or other source of pressure on the recurrent nerve was suspected and carefully sought for, but there was no physical sign of aneurism, no dulness on percussion, and no pulsation or morbid sound; the pulse was equal in the two wrists.

On the 18th, two days after his admission, he spat up a few mouthfuls of florid blood and felt rather faint at the time.

On the 20th, at 1.15, P.M., he suddenly became faint, and brought up, apparently by vomiting, about three quarters of a pint of florid blood. When Dr. Johnson saw him, at 1.45, he was still pale and faint, as if from internal hæmorrhage. No more blood had been brought up, but on percussion over the stomach there was marked dulness, and it seemed probable that the stomach was becoming fill-



ed with blood. He was directed to swallow constantly small pieces of ice. He continued to sink gradually, and died at 5, P.M.

On examination, twenty-three hours after death, an aneurism about the size of a small orange was found at the back of the transverse portion of the arch of the aorta. The aneurism had opened backwards into the œsophagus by an oval aperture three quarters of an inch long and half an inch wide, the opening being partly covered by coagula. The stomach was filled with blood. The left pneumogastric nerve passed in front of the aneurism and was somewhat flattened in doing so. The recurrent nerve passed behind the tumor in its course upwards to the larynx. Both the pneumogastric and its recurrent branch had evidently been stretched and compressed by the aneurism."

In the same number of this journal, p. 34, is the report of another interesting case, which occurred at the London Hospital, and which I here copy in part.

"Thomas D., aged 30, well nourished, and of considerable muscular development, but having large arcus seniles, applied at the hospital Dec. 1, on account of a burning pain in the chest. On inquiry, it was found that lately he had several times spat up a few teaspoonfuls of blood, altogether about a cupful. His appetite was good, and there was nothing to indicate disease of the digestive system. A careful examination of the chest failed to detect any signs of cardiac or lung disease, nor could any aneurismal tumor or abnormal bruit be detected, and there were no signs of venous obstruction (from pressure on the large trunks).

This pain had come on quite suddenly, about a fortnight before he came under notice, and he compared it to a feeling "as though he had swallowed something too hot." At the time that he first felt the pain, his voice became suddenly very hoarse and weak, and it has since become shrill and feeble. He continued his work for a day or two after he first felt the "burning," but his occupation (that of a dock laborer) aggravated the pain so much, whilst it caused him at the same time to make a "crowing noise in his throat," that he was obliged to desist from all labor.

A laryngoscopic examination was made by Dr. Morell Mackenzie, who gave the following report:—

The larynx is quite free from structural disease, and there is not the slightest congestion of the mucous membrane. On inspiration, there is a very slight difference in the position of the vocal cords—the left being a little nearer to the median line than the right. On the left side, also, the capitulum Santorini is a little nearer to the median line, and on a rather higher level than its fellow, and the same observation applies to the left aryteno-epiglottidean fold and its contained cartilage. This condition of the left side of the larynx is not so marked as in the other cases of unilateral spasm of a vocal cord that have come under my notice; but it must be remarked that, in

this instance, neither of the vocal cords is so much drawn aside in inspiration as is commonly the case; this fact would account for relative differences between the two sides being less marked than is usual. On gentle phonation, the left vocal cord is observed to remain fixed, whilst the right advances well to the median line; a small space remains between the vocal cords. On forced phonation, the right vocal cord crosses over the middle line, so that its inner edge touches the left cord. When the vocal cords are approximated in this way, the whole of the right cord, but only about one third of the breadth of the left true cord, can be seen. It was carefully noted that this appearance was not due to any difference in the size of the false cords; that is to say, the left true cord was not at all eclipsed by the false cord on the same side. The patient can only speak in a high-pitched, squeaking voice, of a somewhat falsetto character.

It may not be out of place to observe that the long-recognized relation between aneurism of the arch of the aorta and an altered tone of voice was first proved with the laryngoscope to depend on paralysis of the left vocal cord, by Professor Traube, of Berlin. Cases also have since been observed by Drs. Semeleder, Smyly and others. In Traube's case, besides an immobile condition of the left vocal cord, there was hyperæmia of the false cords and epiglottis, and of the mucous membrane over the arytenoid cartilages.

Subsequent to this report the patient has become worse, and now the left pulse is decidedly fuller than the right, and there is a very slight systolic murmur, but only to be heard at the apex of the heart. The chest has been examined very many times, but no physical signs of aneurism have been found. There has never been the least difference in the pupils. Taking into consideration all the circumstances of the case, the spasm of the left vocal cord may not unreasonably be thought to depend on pressure of the left recurrent nerve by a thoracic tumor: that the thoracic tumor is an aneurism of the arch of the aorta is very probable. This patient's voice has gradually altered from hoarse to squeaky."

Following these two reports of cases comes, in the number of the *Medical Times and Gazette* of Jan. 16, a letter from Dr. Gairdner, which I also copy:—

"*To the Editor of the Medical Times and Gazette.*

SIR,—I have just perused in your journal of this day, the interesting records of two cases of aneurismal disease, detected mainly by laryngoscopic examination. I am able to add to them a brief statement, not, indeed, of a case of aneurism, but one of tumor, in which this modern addition to our means of diagnosis was of great service. Some months ago I was consulted in the case of a lady, who, for ten years or more, had had a moderate sized goitre-like swelling closely applied to the lower part of the trachea, and extending into the anterior mediastinum.

As the neck was very short and thick, owing to the obesity of the patient, the diagnosis was rather difficult; and as a suspicion had formerly existed of disease of the heart, on account of which she had at one time consulted Sir James Clark, there was a further uncertainty as to the cause of her symptoms. These were—1. A degree of difficulty of breathing and cough, almost equally divided as to characters between thoracic and laryngeal. 2. An alteration in the tone of the voice, and a slightly stridulous inspiration. 3. Expectoration of frothy mucus, just tinged, on one or two occasions, with blood. These symptoms were for the most part recent, the goitre having for many years caused her no inconvenience.

I have fully discussed the importance of these symptoms as indicating aneurism, in my "Clinical Medicine," referred to by your reporter. In this instance, no clear evidence of thoracic disease could be detected, except a slight prolongation of the first sound of the heart, which might very well be regarded as functional. I therefore viewed the symptoms as probably dependent upon the implication of the recurrent, on one or both sides, in the goitre, or in the surrounding thickening of the cellular tissue. The nature of the goitrous swelling being obscure, and the influence of remedies upon it uncertain, the prognosis was grave and anxious. I need say nothing about the treatment. The sudden death of the patient, some time afterwards, fully justified the prognosis, and a *post-mortem* examination, rather hastily conducted, but still practically complete and satisfactory, showed that an apparently carcinomatous degeneration of the thyroid gland was the true cause of the symptom.

The case occurred during Dr. Czermak's visit to Glasgow, and he had an opportunity of examining the larynx during the life of the patient. The parts brought into view by the laryngoscope were all perfectly sound as regards structure and anatomical relations. But the left vocal cord was absolutely motionless in inspiration, and in the formation of the voice. This observation was regarded both by Dr. Czermak and the physicians primarily engaged, as affording complete confirmation to the diagnosis of a tumor implicating the recurrent nerve.

I have for many years habitually employed a rather long forefinger in the exploration of the larynx down to the glottis, and by the method of touch have usually found it easy to acquire valuable information in regard to the state of the vocal cords and arytenoid cartilages in doubtful cases of this kind. I have rarely, if ever, found an exception to the rule, that well-marked laryngeal stridor or cough with imperfectly closed glottis, indicates a tumor pressing on the recurrent, if the epiglottis and glottis are normal. It is partly by giving us greater assurance on this point, and partly by developing the positive proof of inequality of movement on the two sides of the glottis, that laryngoscopy may be expected to assist our diagnosis of a difficult and doubtful class of cases."

I have only a few words to add to what has already been said. In regard to the appearances which are presented in the interior of the larynx when the recurrent nerve is undergoing pressure, these may vary considerably. It has been already intimated that the laryngoscope may detect no abnormal appearances whatever. In such cases the laryngeal symptoms are produced, it may reasonably be inferred, by the irritation of a nerve which is suffering only slight pressure. On the other hand, not only is partial loss of power of the laryngeal muscles often found to exist, but sometimes a complete paralysis is noticed. It is certainly a gratifying circumstance that we are no longer obliged to content ourselves with classing indiscriminately all the abnormal laryngeal phenomena under the indefinite head of functional disturbance, but that we may see pathological changes in the larynx when they exist, and note the manner in which these phenomena are produced. In the patient Watson's case, without the aid of the laryngoscope, we must have explained the hoarseness in very general terms, as consequent upon irritation of the recurrent nerve; with the aid of this instrument, we find a simple mechanical cause for this departure from the normal state in the slackened condition of one of the cords; such a want of tension causing coarse vibrations during phonation, and necessarily a rough, hoarse voice. Had such a state of things been found existing, even if all other symptoms of aneurism had been wanting, and a physical examination of the chest had failed to detect the tumor, we should, I think I may safely say, have been fully justified in concluding that a tumor of some kind or other was being developed, and should have been able to locate it in the course of the recurrent nerve.

I must not forget, before I close, to mention the fact that in very rare instances the recurrent nerve has been found pressed upon by a tumor, when during life no laryngeal symptoms were exhibited. Such an instance is mentioned by the reporter of Dr. Johnson's case, already referred to. At the autopsy, the nerve was found to be "flattened out," and yet the patient's voice had been clear to the last. "It may be," says the reporter, "that the pressure had affected the nerve very gradually, as we know that there is a remarkable difference in the effect of gradual and of sudden pressure on nervous tissue."

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THE CHOLERA AS IT APPEARED AT THE PORT OF NEW YORK  
IN 1865.

By J. SWINBURNE, M.D., PORT PHYSICIAN.

THE "Atlanta," an English mail steamer, iron-built, of 325 feet in length, and 36 feet beam, with two first and second cabins fore and aft on the deck, and three separate steerages of 98, 80 and 70 feet

in length, and 8½ to 9 feet in height, sailed from London on the 10th of October, with a full cargo, and 28 cabin and 12 steerage passengers.

London was at that time perfectly healthy.

On the 11th she arrived at Havre, remaining only one day and receiving 24 additional cabin and 540 steerage passengers, mostly from Switzerland, the southern part of Germany and eastern France, all, with few exceptions, passing through Paris on their way to Havre, some remaining only a few hours, others for days in the metropolis, when already at that time cholera was reported to prevail, though to a limited extent and of a mild type. Among these were two families from Germany, who remained a day at the hotel, "*City of New York*," at Paris, and five days at the "*Weissen Lamm*" and "*Hullgarder Hof*," in Havre. While at these hotels, emigrants who had arrived only a few days before them were taken ill, visited and attended by government officials, and by their orders sent to the hospitals.

The "*Atlanta*" sailed again on the 12th of October.

On the 13th the first death from cholera occurred in the person of a little child in the family from the "*Wiessen Lamm*."

On the 14th, 16th, 18th, 19th and 22d, five deaths from cholera occurred in one family from the "*Hullgarder Hof*."

On the 22d, a friend of the family, also from the *Hullgarder Hof*, but in the 2d steerage, sickened, and died on the 24th.

On the 28th, the first case occurred in the 3d steerage; 3 of the emigrants from London were taken ill on the 30th, all of whom, however, recovered.

When the *Atlanta* arrived, the surgeon reported 60 cases of cholera and 15 deaths during the passage; two more died after her arrival in port, and 6 out of 42 cases admitted on board the hospital ships, making a total of 102 cases and 23 deaths. Of the 42 cases treated in the hospital, 22 were admitted on the 6th; six on the 7th; two on the 8th; seven on the 9th; two on the 15th; three on the 16th; one on the 19th.

From the first case, the disease presented the uniform symptoms pathognostic of Asiatic cholera, and although in comparatively few cases terminating fatally, the same virus produced the milder forms of disease, which destroyed life in twenty-four or even twelve hours.

The "*Hermann*," which sailed from Havre at the same time with the *Atlanta*, arrived at the lower quarantine on the 26th of November. The physician in charge reported 7 deaths—4 children, 3 adults. The former he reported to have died of diarrhoea and inanition; the 3 adults of disease of the heart, inflammation of the bowels, and premature parturition after a few days illness. Singular, however, that the first death occurred in the very family who had lost the mother at the *Hullgarder Hof* at Havre, and whose disease and death, after thirty-six hours illness, the illiterate pea-

sant, her husband, so graphically described, that no doubt whatever could exist that she died of cholera asphyxia.

The "*Cella*," of the same line of steamers, arrived on the 20th from Havre with 360 passengers of the same class, and from the same region of country, but no case of sickness or death was reported during the passage and on arrival.

The "*Mary Ann*," an American bark, from Havre on the 25th of October, arrived on the 12th of December. The captain reported 5 deaths during the passage—4 from cholera; the first died on the 28th of October, the three others on the 3d, 4th and 5th of November, after an illness of one to two days duration. On a small vessel, with a deck scarcely six feet high, and crowded to its utmost capacity, and without any special care or prevention, the disease disappeared, and all on board enjoyed good health for thirty days previous to her arrival in port.

The "*Harpwell*," which sailed on the 28th of October, a few days after the "*Mary Ann*," lost seven infants during the passage, but no cholera cases occurred. Equally exempt were the two first class steamers "*Europe*" and "*America*," with passengers directly from Paris, where the majority had resided for some time previous.

That cholera prevailed in Paris, and to some extent in Havre, has been admitted by all, and what is still more significant, the "*Atlanta*," "*Mary Ann*," "*Hermann*" and "*Harpwell*," had each names on the passenger list which were not among the passengers, but reported to have been sent to the hospital by the local authorities at Havre. The clean bills of health were unquestionably issued by the same spirit which reported 200 cases at Paris at a time when upwards of 300 daily died of cholera.

Although the appearance of cholera was not unanticipated in the port of New York, no facilities whatever were prepared for an efficient quarantine. The *Atlanta* was immediately, upon arrival, sent to the lower bay, the surgeon of the vessel relieved, and as soon as the hospital ship could be prepared and the weather admitted of the removal of the sick, they were all, and as they occurred, transferred to the hospital ship; the baggage of the passengers was opened and aired; the soiled linen washed, and baggage, bedding, and personal effects of every kind subjected to fumigation in cool chambers prepared for that purpose. This fumigation was effected by a mixture of black oxide of manganese, common salt—equal parts, well moistened—and the addition of sulphuric acid, one part to four. The generation of gas was so abundant that one of the hands of the boat could only be restored with difficulty and after hours' attention, from the effects of inhaling the gas, four hours after fumigation had commenced.

The quarantine of passengers has been decried as barbarous and inhuman; and certainly none would be more anxious to grant them better accommodations than the officer in charge. When we, how-

ever, consider that the disease is not in the vessel, but among her passengers, and will necessarily accompany them wherever they go, that the accommodations on board the vessel, if scanty, are at least adequate to their wants and such as they are accustomed to, the neglect of the authorities to provide proper accommodations, though not less fragrant, was at least shorn of its alleged inhumanity and barbarity; in fact, that debarcation does not eradicate the disease, any medical man will admit, and as an instance in proof, I may mention the case of the "North America" in 1854. Cholera existed on board of that vessel two weeks before her arrival in port. Ten of her passengers had died during that time, and seven cases were sent to the hospital on her arrival. The day following, all her passengers were landed. In three days, 128 cases and 32 deaths occurred among 250 passengers, while the crew remained perfectly healthy, and no new cases could be traced to the vessel.

The passengers of the "Atlanta" received pratique ten days after the occurrence of the last case, and the vessel, a few days afterwards, was thoroughly cleansed and repeatedly fumigated.

As facts are the only true basis of inference, I have limited my observations to simple recital of facts. Facts alone can guide us in a practical rational quarantine, and however much even medical men may differ as to the mode of its administration, all, I think, must agree upon the necessity of quarantine, both of sick and exposed.—*Medical and Surgical Reporter*.

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### Bibliographical Notices.

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*Chloroform; its Action and Administration.* By ARTHUR ERNEST SANSOM, M.B. Lond. Philadelphia: Lindsay & Blakiston. 1866. Pp. xii., 279.

Of the twenty chapters of this book, seven discuss the dangers of chloroform, the nature and mode of death from its use, and the methods of resuscitation therefrom. This ought to be its all-sufficient commentary.

One of the warmest and most polemical advocates of chloroform, Mr. Charles Kidd, in September, 1865, conceded 250 deaths to have been caused by chloroform.\* Mr. Sansom, remarking that it has been impossible to obtain the records of all the fatal cases, admits but 109, that being the number the facts of which have been collected by the

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\* The Philadelphia *Medical and Surgical Reporter*, Jan. 13th, 1866, quotes Mr. Kidd as saying, "that during this year (1865) he had extracted notes from various newspapers and medical journals of over a dozen deaths by chloroform, 'deaths lying *perdu*, as it were, or hidden, but all bearing out the views of 250 others that he had in vain collected and offered the British medical and other weeklies."



recent Chloroform Committee of the Royal Medico-Chirurgical Society.  
In these death occurred

Before the full effect of chloroform was obtained, in	-	-	-	50
During the effect, in	-	-	-	52
At a period not stated, in	-	-	-	7
				<hr/> 109

In 72 instances the victims were males and in 37 females. In 62 cases, the chloroform was administered for "minor causes."

In explanation of these striking statements, the author says, "Nature provides in disease a gradual depression of the functions; an accommodation by degrees to a less perfect life. An animal which has been gradually accustomed to breathe an impure atmosphere will continue alive, though another healthy one plunged therein will die immediately." We fail to perceive the force of this theory, but Mr. Sansom argues that hence "the feeble bear chloroform better than the strong; children are the best subjects of all; women are better than men; men are most prone to death when they are in the prime of life; and when they are debilitated by pre-existing disease their chance is better than when they submit to chloroform for trivial causes in more perfect health and strength; and, further, the chance of ultimate recovery is greater when an operation is done under chloroform for a diseased condition than when it is undertaken for an injury."

The indiscriminate administration of chloroform is asserted to be dangerous; the intemperate, those having fatty hearts, the nervous and hysterical, and those suffering under shock of the nervous system are pronounced by Mr. Sansom to be especially prone to suffer the accidents of chloroform administration.

"Experiments upon the lower animals, equally with observations on man, prove that there is but a narrow limit between that strength in which the vapor may be safely inhaled and that which is likely to produce alarming symptoms, if not death." "Consequently nothing but the most approved inhaler should ever be used, and an atmosphere containing four and a half per cent. of chloroform is all that can with safety be employed; this ratio should be sustained by mechanical means and by no guess-work contrivances." "In thirty-six deaths the average amount of chloroform used was 1.7 drachms."

We have selected these paragraphs for citation to show that the book furnishes us with no new ideas of chloroform, or affords any reassurance in its use. On the contrary, it adds to our pre-existing fears; it appals us by the dangers it describes; it intimidates by the extreme caution demanded in its exhibition, by the failure of the greatest care to avert a fatal result.

The compromise adopted by the Chloroform Committee above alluded to, accepted and approved by Mr. Sansom, of a mixture of sulphuric ether and chloroform, is, we conceive, if not a triumph on the part of ether, at least a tacit condemnation of chloroform. That Committee remark that "it is quite possible that at some future time an anæsthetic may be discovered which will fulfil the required condition yet more perfectly than these mixtures." That discovery was made on the 13th of Sept., 1846 (at 19 Tennant's Row, Boston, Mr. Sansom has it), and has been in daily use since Nov. 7th, of the same year, when the first capital operation in which pain was totally

annulled, was performed at the Massachusetts General Hospital, one year, less three days, before the anæsthetic properties of chloroform were discovered. From that day to this not a single unavoidable accident has resulted in its use, nor has it ever failed, in hands familiar with its administration, to produce complete, satisfactory and perfectly safe anæsthesia. The converse of all which relates to the danger of chloroform is true of ether. Where chloroform threatens, sulphuric ether affords entire immunity from danger, and where chloroform is safe, sulphuric ether is safer; and if, as stated by Mr. Sansom, six minutes is the average time required to accomplish anæsthesia by chloroform, one of the chief arguments hitherto urged in its favor, as compared with sulphuric ether, is destroyed, since that is a liberal allowance of time to easily effect a thorough etherization.

In this connection, and as bearing on the question of the practical use of ether, the recently published statistics, contained in "Circular No. 6, War Department, Surgeon General's office, Nov. 1, 1865 (p. 87), are interesting. It appears that the reports of 23,260 surgical operations have been consulted in regard to the employment of anæsthetics. "Chloroform was used in 60 per cent. of these, ether in 30 per cent., and in 10 per cent. a mixture of the two was administered (in 40 per cent. a more bulky anæsthetic than chloroform was adopted). At the general Hospitals, the greater safety of ether as an anæsthetic was commonly conceded. It was often employed, and no fatal accident from its use has been reported. In the field operations chloroform was almost exclusively used. In seven instances fatal results have been ascribed with apparent fairness to its use. Detailed reports of these unfortunate cases are on file."

We have only to say, in conclusion, that Mr. Sansom appears to have written a complete and candid treatise on the subject of chloroform. We regret to think that a firm, usually so judicious, should have deemed it for their interest to reprint the book, or that there are in the United States enough persons so blind to their own interests and the safety of their patients, as to purchase even a small edition. Would the public, by purchasing, endorse the propriety of publishing an essay on the "domestic uses of gunpowder," or on "camphene and its admirable adaptation for kindling fires"? The book is well printed and on good paper, but it should have been bound in black, with a "death's head" stamped on the covers, as apothecaries label their laudanum when they dispense it in phials.

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*On Wakefulness. With an Introductory Chapter on the Physiology of Sleep.* By WILLIAM A. HAMMOND, M.D., &c. &c. Pp. 93. Philadelphia: J. B. Lippincott & Co. 1866.

A good portion of this valuable little monograph appeared last summer in the *New York Medical Journal*, but at the request of friends, and wisely we think, Dr. Hammond has added new matter, and published it in a more permanent and accessible form. It contains four chapters—On the Physiology of Sleep; the Pathology of Wakefulness; the Exciting Causes of Wakefulness; and the Treatment of Wakefulness. Contrary to the views of many writers, he believes that sleep is not caused by a congested state of the brain, but by a diminished supply of blood, and cites in corroboration of this theory

the results of various experiments upon animals, observations made upon patients whose brains were laid bare by accidents, and the physiological effects of certain natural agents and drugs.

Accepting this as the explanation of the physiology of sleep, the pathology of insomnia is of course reduced to an active or passive, hyperæmic condition of the brain, and the exciting causes of this abnormal state are simply circumstances which increase the cerebral circulation. These are enumerated by Dr. Hammond as follows:—  
 "1st. By long-continued or excessive intellectual action, or any powerful emotion of the mind. 2d. Those positions of the body which tend to impede the flow of blood from the brain, and at the same time do not obstruct its passage through the arteries, while causing hyperæmia, also produce insomnia. 3d. An increased amount of blood is determined to the brain, and wakefulness is produced by certain substances used as food or medicine. 4th. Wakefulness is also caused by functional derangements of certain organs of the body, whereby an increase of the blood in the brain is produced."

The treatment of insomnia, as recommended in the concluding chapter, is very simple, and consists almost wholly in hygienic measures. The book contains reports of many interesting cases, and is published in a very neat form.

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*The Principles of Surgery.* By JAMES SYME, F.R.S.E., Professor of Clinical Surgery in the University of Edinburgh, &c. &c. To which are appended his Treatises on "The Diseases of the Rectum," "Stricture of the Urethra and Fistula in Perineo," "The Excision of Diseased Joints," and numerous additional contributions to the Pathology and Practice of Surgery. Edited by his former pupil, DONALD McLEAN, M.D., L.R.C.S.E., Professor of the Institutes of Medicine and Lecturer on Clinical Surgery, Queens University, Canada. 8vo. Pp. 880. Philadelphia: J. B. Lippincott & Co., 1866.

It is now more than thirty years since an edition of Mr. Syme's Principles appeared in this country, and although five editions of the work have been published in the meanwhile in Great Britain, the later writings of this distinguished teacher of Surgery have hitherto been inaccessible to the American reader. Even now we are indebted to a member of our profession in Canada for this the most complete collection of his works yet published. Prof. McLean, in compliance, as he states, with numerous and urgent requests of his professional brethren here and in Canada, addressed a communication to Prof. Syme, to which he replied: "As to your proposal of republication in America, I have long desired that what I have written should be known in a pure form, and will therefore feel much obliged by your undertaking the task." As will be seen by the title the editor has added to the Principles some of the most important treatises of his old teacher on various subjects connected with surgery, as well as contributions made from time to time to medical journals.

As to the scientific character of Prof. Syme's views, it is not our intention to speak. Our readers are without doubt generally familiar with them, for he is a man who has never allowed them to fall into obscurity for want of personal energy in their promulgation or de-

fence. Valuable as they are as the principles which have been so long taught in this distinguished school of medicine, they do not supply the wants of a text book as now understood. They are the record of personal experience and convictions, and are largely wanting in those practical details and generalizations from the whole history of surgery, which are so essential to a complete handbook. He states that it has not been his aim "to collect all that might be said in regard to each subject, but rather to select what seemed of most importance, and arrange it in a convenient order for teaching or study, so as to constitute a framework of surgical science, which might be filled up through the gradual acquisition of professional knowledge." The appendix comprises more practical matter, however, and several of the treatises there found are well known and excellent monographs.

Prof. McLean introduces in the preface of the American edition, a highly laudatory account by Dr. John Brown, of Edinburgh, of the personal qualities of Prof. Syme, which shows that he possesses friends who at least love much, if not always wisely. Our readers will remember an occasion recorded not long since in the *Journal*, where this affection betrayed the respected author of *Hæmorrhæe subsecivæ* into a situation which little became him, that of an accomplice in the public immolation of a scientific pamphlet. It is thus that the latter writes of his "old master and friend." "As an instrument for discovering truth I have never seen his perspicacity equalled. His mental eye is achromatic, and admits into the judging mind a pure white light, and records an undisturbed, uncolored image, undiminished and unenlarged in its passage; and he has the moral power, courage, and conscience to use and devote such an inestimable image aright."

We cannot too highly commend the beautiful style in which the publisher has done his work. In paper, in type and all which makes up a handsome book, we have seldom seen its equal among medical publications in this country.

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*On Diseases, Injuries, and Malformations of the Rectum and Anus; with Remarks on Habitual Constipation.* By T. J. ASHTON, formerly Surgeon to the Blenheim Dispensary, &c. With Illustrations. Second American from the Fourth and Revised English Edition. 8vo. Pp. 287. Philadelphia: Henry C. Lea. 1865.

THE short period which has elapsed since the appearance of the former American reprint, and the numerous editions published in England, are the best arguments we can offer of the merits, and of the uselessness of any commendation on our part of a book already so favorably known to our readers. The author has re-written some portions of, and added further cases to the present edition. The American publisher has issued it in clear type and on good paper.

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DURING the year 1865, the whole number of deaths in Providence, R. I., was 1,210, or 71 less than in 1864. The most marked feature of the mortality for the year 1865 was the large number of deaths from scarlet fever in the first four months, and from typhoid fever in the last four months of the year. The population of the city by the census of 1865, was 54,595, which gives one death in 45.1 for the year.

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 THE BOSTON MEDICAL AND SURGICAL JOURNAL.
 

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 BOSTON: THURSDAY, JANUARY 25, 1866.
 

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DISCOVERY OF THE CAUSE OF INTERMITTENT FEVER, BY DR. J. H. SALISBURY.—One of the most important discoveries of modern times in the ætiology of disease has just been modestly announced in the pages of the *American Journal of the Medical Sciences*, by Dr. J. H. Salisbury, Professor of Physiology, Histology and Pathology in the Cleveland Charity Hospital Medical College; this is no less than the discovery by him of the organic cause of intermittent and remittent fevers. Distinguished already by his remarkable discovery of the origin of a form of measles from a species of fungus growing upon wheat straw, his present discovery places him in the very foremost rank of those whose researches have conferred a wide-spread and lasting blessing on mankind. Few problems in pathology have taxed the ingenuity and theoretical faculties of the medical profession to such a degree as the question which Dr. Salisbury has solved, and few have led to such crude and unsatisfactory results. The sum of all heretofore known on the subject has been, that in certain localities adjacent to water courses, marshy, or freshly-broken alluvial soil, in the warmer regions of the earth, where the geological formation is of the more recent periods, at certain seasons of the year, a poisonous influence is given out, known under the comprehensive term *miasma*, which produces certain forms of fever. This poisonous atmosphere has hung like a spell over some of the fairest regions of the earth, making the spots of all others most attractive to the imagination the most deadly to human life. We can, therefore, hardly overestimate the value of Dr. Salisbury's observations, substantiated, as they seem to be, by the most patient investigation and experiment, and demonstrating the way by which the wide-spread diseases which they explain may be in most instances entirely averted.

It is to the faithful use of the microscope that Dr. Salisbury owes the discovery which has unlocked this profound secret, and which has taken these diseases out of the mysterious category which some have felt inclined to ascribe to the direct agency of the great First Cause. A secondary cause has proved to be the agent, but of so subtle a minuteness that mankind has been obliged to wait for the modern application of improved instruments of investigation, to show that it is none the less material and appreciable by the senses. In a word, Dr. Salisbury has discovered that the minute spore of a cryptogamic plant, floating in the moist vapor of the malarious regions where remittent and intermittent fevers abound, is the deadly poison which has been such a scourge for ages, the *fons et origo mali*. This is a little oblong cell, "consisting of a distinct nucleus, surrounded by a smooth cell-wall, with a highly clear, apparently empty space between the outer cell-wall and nucleus," of an algaoid type, resembling strongly the cells of palmellæ. These cells Dr. S. first detected in great numbers in the expectoration of patients suffering from intermittent fever and those residing on ague levels and exposed during

evening, night and morning to the damp exhalations and vapors of such localities. The salivary secretions contained microscopic cells and other bodies, but the only constant bodies found in every case examined were the cells in question. These he proceeded to collect from the poisonous localities by suspending plates of glass about one foot above the partially submerged marshy grounds and stagnant pools of such localities during the night. Invariably, in the morning, the under side of the glass was found to be coated with drops of water containing many of the microscopic bodies detected in the expectoration referred to above, but none of the peculiar cells; these were found in considerable numbers on the upper surface of the glass only. Repeated experiments in various localities produced, in all instances, the same results. In prosecuting his researches, Dr. Salisbury discovered the source of the algoid cells, fully confirming his impression of their real character. We quote from his memoir as follows:—

"In passing to the stagnant pools and swampy grounds southeast of the city of Lancaster, Ohio, to suspend the glass plates, I had to pass over a rich, peaty prairie bog, where the water had become mostly dried off, and the surface broken by the tread of cattle. I had noticed that in walking over this ground, a peculiar dry feverish sensation was always produced in the throat and fauces, often extending to the pulmonary mucous surfaces, and that my expectoration was, after returning, filled with the minute oblong cells above described. This drew my attention to the partially desiccated peaty bog, where the surface had been recently broken by the tread of cattle. I discovered on the recently exposed earth, what appeared to be a whitish mould, or more closely the incrustation of some salt. I here suspended the plates of glass, and the following morning, much to my delight, found the inferior surface of the plates covered with the minute cells, which I was in pursuit of. I immediately returned to the bog and secured samples of fresh earth, which were covered with the incrustation, and some which were not, and also portions of the boggy turf. On placing a fragment of the incrustation under the microscope, it was at once discovered to be made up of aggregated masses of the minute cells so uniformly met with in the expectoration of those exposed to the influence of the heavy cool vapors of malarial levels. It was further seen that these cells were algoid, and emanated from plants of a palmelloid type, as we had previously suspected; that there were several species, and that in the larger ones, grew several species of mucedinous fungi."

Other ingenious experiments showed the height to which these microscopic bodies are raised above the surface, leading to the following results:—

"1. That cryptogamic spores and other minute bodies are mainly elevated above the surface during the night. That they rise and are suspended in the cold, damp exhalations from the soil, after the sun has set, and that they fall again to the earth soon after the sun rises.

"2. That in the latitude of Ohio, these bodies seldom rise above from thirty-five to sixty feet above the low levels. That in the northern and central portions of the State, they rise from thirty-five to forty-five feet, while in the southern, from forty to sixty feet.

"3. That at Nashville and Memphis, they rise from sixty to one hundred feet and more above the surface.

"4. That above the summit plane of the cool night exhalations, these bodies do not rise, and intermittents do not extend.

"5. That the day air of malarial districts is quite free from these palmelloid spores, and from causes that produce intermittents."

Pursuing his researches Dr. Salisbury visited many ague-infected districts, and in every instance was able to demonstrate the existence in such places of the ague palmellæ; some of the cases which he relates in illustration are exceedingly curious, demonstrating with absolute conclusiveness their agency as the morbid cause, but want of space prevents our quoting them. In some instances, where intermittent fever has recently appeared in a locality never before infested, he was able to trace it to an abundant growth of the poisonous algoid on the sides of a newly opened ditch close by, which had never been suspected before of being the source of the disease. Finally Dr. Salisbury applied the crucial test to his theory of the malarial potency of these plants, by direct experiment as follows:—

"I filled six tin boxes with the surface earth from a decidedly malarious drying prairie bog, which was covered completely with the palmellæ previously described. Cakes of the surface soil were cut out, the size and depth of the boxes, and fitted carefully in, without disturbing more than possible the surface vegetation. The covers were then placed on, and the boxes transported to a high, hilly district, some five miles distant from any malarious locality, and where a case of ague had never been known to occur. The locality was over three hundred feet above the stream levels, was dry, sandy, and rocky. I here placed the boxes of cryptogams on the sill of an open second-story window, opening into the sleeping apartment of two young men; removed the covers and gave particular directions that the boxes should not be disturbed, and the window left open. On suspending a plate of glass over the boxes on the fourth day, during the night, the under surface of the plate, the following morning, was found covered with palmelloid spores, and numerous cells of the same kind adhered to a suspended plate in the room, which was moistened with a concentrated solution of chloride of calcium.

"On the twelfth day, one of the young men had a well-marked paroxysm of ague, and on the fourteenth the other was taken down with the disease. They both began to feel unnatural and dull about the sixth day. All three stages of the paroxysms were well marked. The type in both cases was tertian, and was readily controlled by the appropriate remedies.

"Four members of the family slept on the lower floor of the house, but none of them were affected."

Other experiments produced similar results; certainly nothing could be more conclusive.

Turning once more to the subjects of intermittent fever Dr. Salisbury found that "ague plants, the same as grown upon the ague soil, are constantly developing in the system of the intermittent fever patient; and that the urinary organs constitute one important outlet for the elimination of this fever vegetation. . . . This explains to us the important reason, why it is that quinia breaks the continued



recurrence of the paroxysms, while it does not eradicate the poison; and why diuretics and diaphoretics and expectorants are such all-important aids in eliminating from the system the malarial cryptogams.

The ague plants occur in the urine in the form of little cottony flocks, so small that they are scarcely noticeable by the unaided eye, and too few in number to communicate turbidity to the excretion. They vary greatly in amount present in different cases. They are uniformly more abundant when the disease is severe and has continued for some time. They are very light in color, highly transparent, and appear to be developed in the bladder, pelves of the kidneys and ureters, often in considerable numbers."

Dr. Salisbury describes no less than five species of these poisonous plants, to which he gives the generic name of *Gemiasma*. To another type he gives the generic name of *Protuberans*. We are unable to copy his interesting descriptions of them. We will only add, that sprinkling the surfaces on which they grow with caustic lime is sure to prevent the development of the ague plants.

We have thus given a hasty sketch of what strikes us as one of the most valuable discoveries in medical science ever made, and worthy to be classed with the discovery of the protective power of vaccination and the pain-destroying power of anæsthetics.

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We have received a communication on the subject referred to in our last two numbers, "A question which should be settled," signed F.M.M.S., as follows:—

MESSRS. EDITORS:—In your issue of January 11th, is an article in regard to "a question that should be settled." I am most happy to see the spirit of candor and good feeling which it breathes. It exhibits none of the feelings of unkindness of which it speaks.

The question, as I understand it, is—not whether the New England Female Medical College furnishes a good and regular medical education to its pupils—"that is an entirely different issue"\*—but simply whether the By-laws of the Massachusetts Medical Society allow its members to professionally treat persons of the female sex as regular practitioners of medicine.

Upon this question I beg leave to say, in the first place, that I think it quite probable, to say the least, that the framers of those By-laws never so much as even dreamed that a woman ever would or could acquire a good and regular medical education. And yet there is no evidence in those By-laws that they did not. Certain it is that if they had, and if they had *intended* to provide for such a contingency, they would have been very likely to have framed the article in question just as we find it. For, we have in our language nouns which do not at all designate the gender of the person spoken of, but are used to designate a human being of either sex. The word "person" is such a noun, and the framers saw fit (and no doubt for some good reason), to use this very word when defining who might become members of the Society, in the first article, and also again in the eighth article designating whom the members of the Society should regard and treat as

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\* That is right—"One war at a time."

irregular practitioners. But unfortunately we have not in our language any pronoun of common gender corresponding with the French pronoun "*on*." Consequently we are not very unfrequently compelled to use one that is either masculine or feminine, after, or instead of, a noun of common gender, and it is distinctly recognized by all grammarians as well as by all good writers as the *rule* in such cases, to use the masculine pronoun after a noun of common gender, as is the word *person*; for instance, we say, Every person should speak the truth with *his* neighbor. *He* should be honest in *his* dealings. In the Statute Laws of this State we read, "No person shall be held to answer on a second indictment for an offence of which *he* has been acquitted, &c.—" *Quæ cum ila sunt*," I most confidently submit that by any fair interpretation the By-laws in question do not specify and were not designed to specify the *sex* of the "persons" who may be admitted to membership of the Society, or who may be treated as regular practitioners by its members. The word "*person*" as there used evidently means any human being.

In regard to the "common feeling," of which the writer speaks, I beg simply to suggest, that so far as I know (and I have some little acquaintance over the State) those feelings and expressions of unkindness, bitterness and contempt he mentions are *very much* confined to *Boston* and its immediate vicinity.

The remainder of the communication is devoted to an historical account of the course of Boston with regard to female education, not specially relevant to the subject in hand, and the pressure on our pages this week compels us to omit it.

In reply to the above we have only to say, that be the opinions on the subject what they may, the question should be settled *by authority*. The simple fact that female medical practitioners were not thought of by the founders of the Massachusetts Medical Society is to our minds a most cogent reason for the action of the Society now.

#### VITAL STATISTICS OF BOSTON.

FOR THE WEEK ENDING SATURDAY, JANUARY 20th, 1866.

##### DEATHS.

	Males.	Females.	Total.
Deaths during the week	41	40	81
Ave. mortality of corresponding weeks for ten years, 1853—1863	41.3	40.2	81.5
Average corrected to increased population	00	00	87.62
Death of persons above 90		1	1

DIED.—At Newton Corner, Jan. 21, Dr. Henry Bigelow, aged 48 years.—At St. Albans, Vt., Jan. 15, Dr. H. F. Stevens, aged 48 years.

DEATHS IN BOSTON for the week ending Saturday noon, January 20th, 81. Males, 41—Females 40. Accident, 1—aneurism, 1—apoplexy, 2—inflammation of the bowels, 1—congestion of the brain, 1—disease of the brain, 3—inflammation of the brain, 2—bronchitis, 1—burns, 1—cancer, 4—consumption, 20—convulsions, 1—croup, 3—diphtheria, 1—dropsy, 2—dropsy of the brain, 3—drowned, 1—exposure, 2—scarlet fever, 1—typhoid fever, 1—gastritis, 1—disease of the heart, 3—infantile disease, 1—leucocythæmia, 1—disease of the liver, 1—congestion of the lungs, 1—inflammation of the lungs, 6—old age, 1—phlegmasia dolens, 1—phlebitis, 1—premature birth, 1—rheumatism, 1—scalded, 1—smallpox, 1—stricture of the œsophagus, 1—tumor, 1—unknown, 6.

Under 5 years of age, 18—between 5 and 20 years, 10—between 20 and 40 years, 21—between 40 and 60 years, 20—above 60 years, 12. Born in the United States, 52—Ireland, 23—other places, 6.

